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RESEARCH PAPER

The Effectiveness of Gardner's Multiple Intelligence Theory on Teaching Strategies of University Teachers DG Khan, Pakistan

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ABSTRACT

The study aimed to identify the various intelligence levels among university instructors and their correlation with teaching practices. The sample of 151 male and female university lecturers from Ghazi University was chosen using simple random selection. The study employed two questionnaires: the Teaching Strategies Questionnaire and the Multiple Intelligence's Questionnaire. The data analysis methods employed were correlation analysis and the t-test. Apart from visual and kinesthetic intelligence, there was no statistically significant difference found. The corresponding teaching methodologies for linguistic, logical, visual, musical, kinesthetic, interpersonal, intrapersonal, naturalistic, and existential intelligence's were discovered to positively correlate with one other. This study recommends that appropriate environments and facilities be provided for the scientific method, independent projects, and training experts in the planning and adoption of different teaching strategies based on the various intelligence dimensions of the student.

KEYWORDS Gardner Multiple Intelligence Theory, Teaching Strategies, Ghazi University Teachers

Introduction

Fundamental changes in educational institutions and teaching methods are brought about by the wide and rapid advancements in science, technology, communication, and the rise of fresh perspectives on social, political, economic, and cultural concerns in today's world (Otaghsara, 2012). Intelligence is significant because it influences a wide range of human behavior. Since learning and "intelligence" are closely related psychological processes, most educators base their decisions on this understanding (Khamis & Sammons, 2004). The definition of "intelligence" may be traced back to Aristotle, Socrates, and Plato, three ancient Greek philosophers, according to H. Gardner, Wake et al., (1996).

Multiple intelligences' fosters a student-centered classroom environment (Davis, 2017; Tamilselvi & Geetha, 2015; Madkour & Mohamed, 2016). The performance of the students is further enhanced by a range of various intelligences (Milad, 2018). The psychologist Howard Gardner is another supporter of the theory of multiple intelligence's in (1983, 1999). Gardner suggested that there are eight distinct intelligence's (linguistic, logical mathematical, spatial, musical, kin-esthetic, interpersonal, intrapersonal, naturalistic) that can be distinguished from one another, arguing that it would be evolutionary useful for different people to possess a variety of abilities and skills.

It has been noted that the majority of Pakistani university students struggle with conceptual understanding. Teachers may be using outdated teaching methods, which might be one of the causes of the conceptual learning deficit. According to the literature,

there are a number of ideas that focus on how to include the interests of pupils (Krapp & Prenzel, 2011). Multiple Intelligence (MI) idea is one such idea that Howard Gardner proposed. Nonetheless, it was necessary to figure out how these MI-related methods of teaching can speed up learning and improve instruction, especially in Pakistan. This study looks at the university instructors' varied intelligence levels and how well they work with corresponding teaching techniques. The research is important because it will enable instructor to recognize that their pupils differ from one another and that instead of having every student perform the same task or apply the same instructional strategies in every class, they might all study the same content by doing distinct tasks or by employing various teaching strategies. Additionally, the Multiple Intelligence Theory gives developers of educational programs, teachers, and caregivers a platform to analyze and provide pupils instruction and education, and evaluation processes in a unique styles.

Literature Review

Howard Gardner, a developmental psychologist at Harvard, initially proposed the idea of multiple intelligence's in 1983. According to this idea, human intelligence may be classified into the following modalities: interpersonal, intrapersonal, logical-mathematical, musical-rhythmic, verbal-linguistic, visual-spatial, naturalistic, and bodily-kinesthetic.

In order to fulfill the demands of 21st-century educators and students, Pakistani educators have recently been seeking for innovative approaches to enhance their current educational framework (Fullan & Watson, 2000).

Types of intelligence

Several intelligences emerged in the early 1980s, arguing that the limitations of conventional psychometric intelligence results should be acknowledged.

Visual-Spatial Intelligence

Strong visual-spatial intelligence make a person excellent at picturing things. Individuals with Visual-Spatial Intelligence like learning to read, write, and assembling puzzles.

Linguistic-Verbal Intelligence

The definition of linguistic intelligence is the ability to effectively convey and comprehend abstract and complicated knowledge through communication. Reading and writing may be enjoyable activities for those with verbal-linguistic intelligence. They are adept at presenting ideas clearly, engaging in discussion, breaking down ideas, and cracking jokes.

Logical-Mathematical Intelligence

Individuals with a high level of logical-mathematical intelligence are adept in analyzing issues, seeing mathematical trends, and reasoning, according to Howard Gardner's hypothesis of multiple intelligences. According to Howard Gardner, a strong logical-mathematical intelligence enables one to solve problems abstractly. Those with logical-mathematical intelligence are excellent at interpreting difficult concepts and providing to elegant answers.

Kinesthetic Intelligence

Higher bodily-kinesthetic intelligence is associated with an increased tendency for gifted activities, organ movements, and muscle coordination according to Howard

Gardner's concept. They are more likely to possess exceptional hand-eye coordination and accuracy.

Bodily-kinesthetic intelligence is characterized by a keen awareness of one's physical attributes and spatial mobility. They can maintain positions for extended periods of time, see images in their minds, and comprehend how their bodies move.

Musical Intelligence

According to Howard Gardner's view, those who possess those with strong musical intelligence are skilled at using appears, rhythms, and rhythmic structures to inform their conclusions. This type of intelligence in young pupils may bring a variety of skill sets to the classroom, such as a love of rhythm and patterns. Gardner asserted that having higher language intelligence was comparable to having musical intelligence.

Interpersonal Intelligence

The ability to understand & sympathize with others, establish connections with them, and successfully convey ideas or solutions is known as interpersonal intelligence. Interpersonally intelligent people can listen to others, be with others, talk to others, ask questions of others, and bring others out. They are gifted communicators who can quickly pick up on people's ideas, feelings, motives, and actions.

Intrapersonal Intelligence

The capacity to understand themselves, including the ideas and emotions one has, and to use that understanding to plan and direct one's life is known as intrapersonal intelligence. Intrapersonal intelligence enables people to understand how they feel and think. They are fundamentally introspective, able to manage their emotions and deal with their preferences.

Naturalistic Intelligence

Gardner argued that those with high Naturalistic Intelligence had a stronger connection to nature and a keen interest in learning about it. They are extremely sensitive to even modest changes in their habitats. The ability of humans to discriminate between living things (plants and animals) and to be sensitive to other elements of the natural world (such as clouds and rock formations) is referred to as naturalist intelligence.

People with strong naturalistic intelligence excel in caring for plants and animals. They have a natural sense of sensitivity. Examples include landowners, ecologists, landscapers, and wildlife managers (Gardner, 1999; H. Gardner, 1983).

Existentialistic Intelligence

It includes sensitivity and the ability to address fundamental concerns regarding questions about the meaning of life, the reason for death, and the origins of humanity. Existential intelligence is the ninth category of intelligence proposed as an expansion on Gardner's original idea. Gardner (1999) has put out the theory that a person's multiple intelligence's advantages and disadvantages are not static and may change over time.

Multiple Intelligence and Teaching Strategies

The idea has a significant impact on the teaching process by increasing instructors' creativity in developing educational methods. An institution's classrooms are all gardens of differing intelligences. While plants look similar from a distance, each grows uniquely

and generates a unique biological product" (Temur, 2007). According to Stagner and Karwoski, "intelligence refers to learning ability, ability to manipulate abstract symbols, ability to see learning in new situations, and ability to solve problems." Because of this, a bright kid can be able to put in an average amount of time and effort and still get decent grades in school, college, or university. Intelligence determines how well things are taught and learned. Teachers may adjust their teaching methods to match the unique demands of each student and guarantee the best possible academic results by being familiar with the concept of multiple intelligences.

Material and Methods

The research utilized a descriptive survey layout, collecting data through two questionnaires. "Research with descriptive technique is learning with and exact analysis of the outcomes," states Borg (2015).

Population

The study's population consisted of all Ghazi University teachers in the DG Khan district, both male and female. About 247 permanent teachers work in the DG Khan area of Ghazi University.

Sample Size

This study employed the simple random sampling approach, giving each participant an equal the probability of getting picked for the sample. Researcher has 247 participants and responses from a random sample are 151.

Research Instrument

The questions were based on Weber's (1999) "Multiple Intelligence Survey" and the linked teaching strategies questionnaire. University teachers were surveyed using two separate questionnaires. The initial questionnaire assessed University Teachers' nine different intellect levels.

The Multiple Intelligences questionnaire assessed the nine distinct intelligences at the levels of teachers. A 4-point Likert scale was used to assess the 27 items in the questionnaire. The questionnaire has twenty methods of teaching that instructors may employ to use the nine multiple intelligence's in their lesson.

Pilot study of Research Instruments

Prior to administering the main questionnaire, a pilot study was carried out with a selection of both men and women university teachers from DG Khan. It was necessary to test and refine the questionnaires before hand to ensure that the items were appropriate.

Validity and Reliability

Denzin and Lincoln (2005) emphasize the importance of validity and reliability when assessing data quality. The questionnaire was given to university instructors, five academics (experts), and an education department supervisor in order to confirm its results. The respondents were pleased with surveys, with the exception of a few statements, which were changed and clarified with the assistance of the study supervisor.

Cronbach's alpha was used to assess the reliability of respondent replies. The multiple intelligence questionnaire's Cronbach alpha was.768, while the teaching techniques questionnaire's Cronbach alpha was.803.

Data Collection Procedure

The educators selected to take part in the research were given the questionnaires by the researcher in person. After a couple days, the researcher personally collected every copy that had been distributed.

Data Analysis

Forms were used to gather data, which SPSS - Windows, version 21 input into a computer file for analysis. An independent-samples t-test with an alpha level of.05 was utilized to compare the means of the nine multiple intelligence's, both genders included and the teaching methods employed by university instructors. The association between university teachers' multiple intelligence's and the instructional strategies they employ in the classroom was examined using the Pearson correlation coefficient.

Table 1
Independent sample t-test for Multiple Intelligences

		Levene's Test For Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig.(2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Linguistics	Equal variances assumed	3.89	.058	-.776	149	.440	-.039	.054	-.145	.060
	Equal variance not assumed			-.804	143.96	.433	-.039	.053	-.143	.063
Logical	Equal variances assumed	.160	.684	.064	149	.963	-.003	.061	-.118	.133
	Equal variance not assumed			.066	138.08	.963	-.003	.060	-.123	.138
Visual	Equal variances assumed	10.9	.005	-2.605	149	.018	-.169	.067	-.398	-.043
	Equal variance not assumed			-2.735	150.83	.006	-.169	.064	-.293	-.048
Musical	Equal variances assumed	.676	.413	-2.360	149	.18	-.160	.066	-.278	-.025
	Equal variance not assumed			-.2367	133.19	.16	-.160	.065	-.279	-.028
Kinesthetic	Equal variances assumed	7.33	.009	-2.543	149	.015	-.158	0.58	-.269	-.033
	Equal variance not assumed			-2.618	146.68	.007	-.158	0.56	-.262	-.039
Interpersonal	Equal variances assumed	4.07	.053	1.939	149	.063	.121	.062	-.059	.241
	Equal variance not assumed			1.890	109.54	.065	.121	.063	-.056	.247
Intrapersonal	Equal variances assumed	.594	.437	-1.806	149	.083	-.133	.068	-.070	.015
	Equal variance not assumed			-1.840	143.33	.076	-.133	.076	-.068	.013
Naturalistic	Equal variances assumed	.281	.578	-.931	149	.344	-.060	.063	-.175	.061
	Equal variance not assumed			-.956	143.84	.339	-.060	.061	-.176	.064
Existentialistic	Equal variances assumed	.221	.654	-.945	149	.349	-.063	.064	-.185	.065
	Equal variance not assumed			-.948	140.34	.344	-.063	.065	-184.	.063

Linguistic Intelligence

The Levene's test of linguistic intelligence's "F" value was 3.8, more than α threshold of.05 (P>.05), possessing a noteworthy p-value (Sig. (p)) of 0.058. Therefore, the null hypothesis was accepted.

Logical Intelligence

The null hypothesis was accepted in this case because the Logical Intelligence test yielded a "F" value of .160 with a Sig. (p) value 0f 0.684, greater than that α level of .05 (p > .05). This suggests that the variances of the two groups (males and females) were homogenous and did not differ significantly.

Visual Intelligence

Given that the Levene's test "F" value for visual intelligence was 10.97 and the Sig. (p) value was.005 both below the significance α level of.05 (P <.05)—it was presumed that the variances in the two Groups varied widely.

Musical Intelligence

The Levene's test "F" value for musical intelligence was.676 with a Sig. (p) of.413, greater than α (P >.05). Consequently, the null hypothesis was accepted, and it was assumed that there would be identical variations in the groups of men and women.

Kinesthetic Intelligence

It was believed that there was heterogeneity in the variations among the male and female groups because the Levene's test yielded a "F" value of 7.339 and a Sig. (p) value of.009, This was not as much as the significance α level of.05 (P <.05).In terms of Kinesthetic Intelligence, it was shown that there were considerable differences between the variances of the male and female groups.

Interpersonal Intelligence

The Levene's test resulted in an "F" value of 4.076 for Interpersonal Intelligence, with a Sig. (p) value of.06, over the significance α limit of.05 (P >.05. As a result, it was concluded that there was no discernible difference between the variances of the two groups and that their variances were homogeneous.

Intrapersonal Intelligence

With a Levene's test "F" value of.594 and a Sig. (p) value of.437, In this case, the null hypothesis was accepted, and it was found that the variances in the two groups were homogenous. This result was higher than the significance α level of.05 (P >.05).

Naturalistic Intelligence

The Levene's test for naturalistic intelligence has an "F" value of.281 and a Sig. (p) of.578. Since P >.05, the null hypothesis was accepted in this case, and it was presumed that both groups' variances were homogeneous.

Existentialistic Intelligence

In terms of linguistic intelligence, the Levene's test yielded a "F" value of.213 with a Sig. (p) value of.658, exceeding our significance limit of.05 (P >.05). Consequently, the null hypothesis was approved, indicating that the variances in the two groups were homogenous.

Table 2
Multiple Intelligence and Related Teaching Strategies Correlations

Multiple intelligent	NO. Of respondents	Existentialism Teaching	Intrapersonal Teaching	Interpersonal Teaching	Naturalistic Teaching	Visual Teaching	Logical Teaching	Kinesthetic Teaching	Linguistic Teaching	Musical Teaching
Existentialism	151	.299	.265	.307	.381	.140	.141	.173	.499	.250
Intrapersonal	151	.356	.228	.275	.454	.418	.122	.090	.336	.396
Interpersonal	151	.233	.184	.270	243	.168	.172	.133	.292	.174
Naturalistic	151	.414	.273	.317	.479	.315	.315	.215	.354	.317
Visual	151	.404	.304	.394	.353	.296	.241	.252	.448	.168
logical	151	.288	.257	.339	.349	.533	.196	.128	.319	.126
Kinesthetic	151	.364	.308	.410	.510	.336	.175	.238	.403	.346
Linguistic	151	.410	.238	.351	.395	.214	.162	.246	.297	.217
Musical	151	.350	.285	.254	.357	314	.146	.092	.365	.361

Existentialistic Intelligence

Existential intelligence and the methods used in instruction associated along with it, as indicated in table 2, revealed a strong and favorable correlation. ($r = +.299$, $p < .05$), according to the Pearson correlation coefficient value ($r = +299$).

Intrapersonal Intelligence

Table 2 illustrates the significant positive association ($r = +.228$) that was discovered between the instructional methods linked to intrapersonal intelligence and that intelligence ($r = +.228$, $p < .05$).

Interpersonal Intelligence

Interpersonal intelligence and the related methods of teaching are positively correlated, as shown by table 2's Pearson correlation coefficient value of +.270 ($r = +.270$, $p < .05$.)

Naturalistic Intelligence

The observed method of teaching related Naturalistic intelligence showed a Pearson correlation coefficient value of ($r = +.478$, $p < .05$) for Naturalistic intelligence. Furthermore, table 2 made clear how very significant the link was.

Visual intelligence

As shown in table 2, there was a significant positive association between visual intelligence and the method of teaching associated with it ($r = +.296$, $p < .05$).

Logical Intelligence

This is shown by table 2, a strong positive association ($r = .196$) was discovered between logical intelligence and logical intelligence-related teaching practices ($r = .196$, $p < .05$).

Kinesthetic Intelligence

The information shown in Table 2 indicated a strong positive correlation ($r = +.238$) between teaching practices linked to kinesthetic intelligence and kinesthetic intelligence ($r = +.238$, $p < .05$).

Linguistic intelligence

The Pearson correlation coefficient shows how teaching methods and language intelligence are correlated was found to be +.294 (r(151) = +.297, p <.05, two-tailed). Table (3) showed a significant correlation.

Musical intelligence

The identified correlation between instructional techniques and musical intelligence related to it is (r = +.361, p <.05) according to Pearson's analysis. Additionally, table 2 emphasizes how important the association is.

Table 3
Correlation of MI and TS

		MI	TS
Multiple intelligence	Pearson Correlation	1	.578
	Sig. (2-tailed)		.000
	N	151	151
Teaching strategies	Pearson Correlation	.578	1
	Sig. (2-tailed)	.000	
	N	151	151

The correlation coefficient between multiple intelligences and their corresponding teaching techniques was determined to be.578. The data in Table 3 indicates that the two variables, Multiple Intelligences and Educating Techniques, have a positive connection.

Conclusion

This study provided light on the intelligence and teaching strategies used by university teachers in the DG Khan district, one of Pakistan's developing areas. The research employed the Gardner Theory of Multiple Intelligence's by accounting for the varied educational backgrounds and areas of study of the respondents, who have high levels of professional and academic qualifications.

For each of the nine multiple intelligence's, there was no discernible difference in the levels of linguistic, logical, interpersonal, musical, intrapersonal, naturalistic, and existentialistic intelligence between the sexes, with the exception of visual and kinesthetic intelligence, where females demonstrated relatively Larger scales than males. The linked teaching methodologies had shown a favorable association with the average levels of various multiple intelligences. The corresponding training methods for naturalistic, musical, sentimentalist and existential intelligence all showed a significant positive association.

One major element of the MI theory, according to Armstrong (2009), is that people may raise their IQs to a proficiency level. The study's findings are consistent with those of Abdul Aziz (2008) discovered that the verbal-linguistic, logical-mathematical, body-kinesthetic, visual-spatial, interpersonal, and intrapersonal intelligence profiles of female faculty members were considerably different from those of male faculty members. With the exception of linguistic and musical intelligences, Asha et al. (2007) observed no significant differences in the various intelligence levels of males and females.

Similar findings were reported by Hanafiyeh (2013); they found that even though the other intelligence's didn't significantly differ from, there was a difference in the degree of linguistic intelligence between male and female respondents. According to Loori (2005), there was not a noticeable distinction between the preferences of men and women for MI.

Recommendations

i. Educational institutions provide teachers with chances to reflect on their experiences in both curriculum and extracurricular activities.

ii. The education department's training of aspiring teachers with the understanding of how to organize, accept, and use MI teaching techniques.

iii. All educational levels, take into account the multiple intelligence component in the course curriculum.

iv. Educational institutions expand the number of educational field trips and provide teachers and pupils the chance to work independently on projects

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